

# Vacuum Systems

GROUP  
**37**

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## **PART 37-01 General Vacuum System Service**

The locations of the vacuum system components found in the engine compartment on 1970 vehicles are shown in the 1970 Wiring Diagram Book, Form 7795-70.

Minor malfunctions such as leaking or disconnected hoses are usually detected easily by listening for air leaks and can be corrected without extensive checking. Under no circumstance

should air pressure be applied to the vacuum system as serious damage could result. For complete vacuum system diagnosis, refer to the Car Diagnosis Manual, Form 7962.

## PART 37-02 Vacuum Door Locks

COMPONENT INDEX Applies Only to Models Indicated	Ford	Mercury	Meteor	Lincoln- Continental	Thunderbird	Continental- Mark III
CONTROL SWITCH—DOOR LOCK Removal and Installation	02-09	02-09	02-09	02-09	02-09	02-09
CONTROL VALVE Removal and Installation	N/A	N/A	N/A	02-08	02-08	02-08
MOTOR—VACUUM DOOR LOCK Removal and Installation	02-08	02-08	02-08	02-08	02-09	02-09
MOTOR—VACUUM TAILGATE LOCK Removal and Installation	02-09	02-09	02-09	N/A	N/A	N/A
VACUUM DOOR LOCK SYSTEM Description and Operation	02-02	02-02	02-02	02-02	02-02	02-02

A page number indicates that the item is for the vehicle(s) listed at the head of the column.  
N/A indicates that the item is not applicable to the vehicle(s) listed.

### 1 DESCRIPTION AND OPERATION

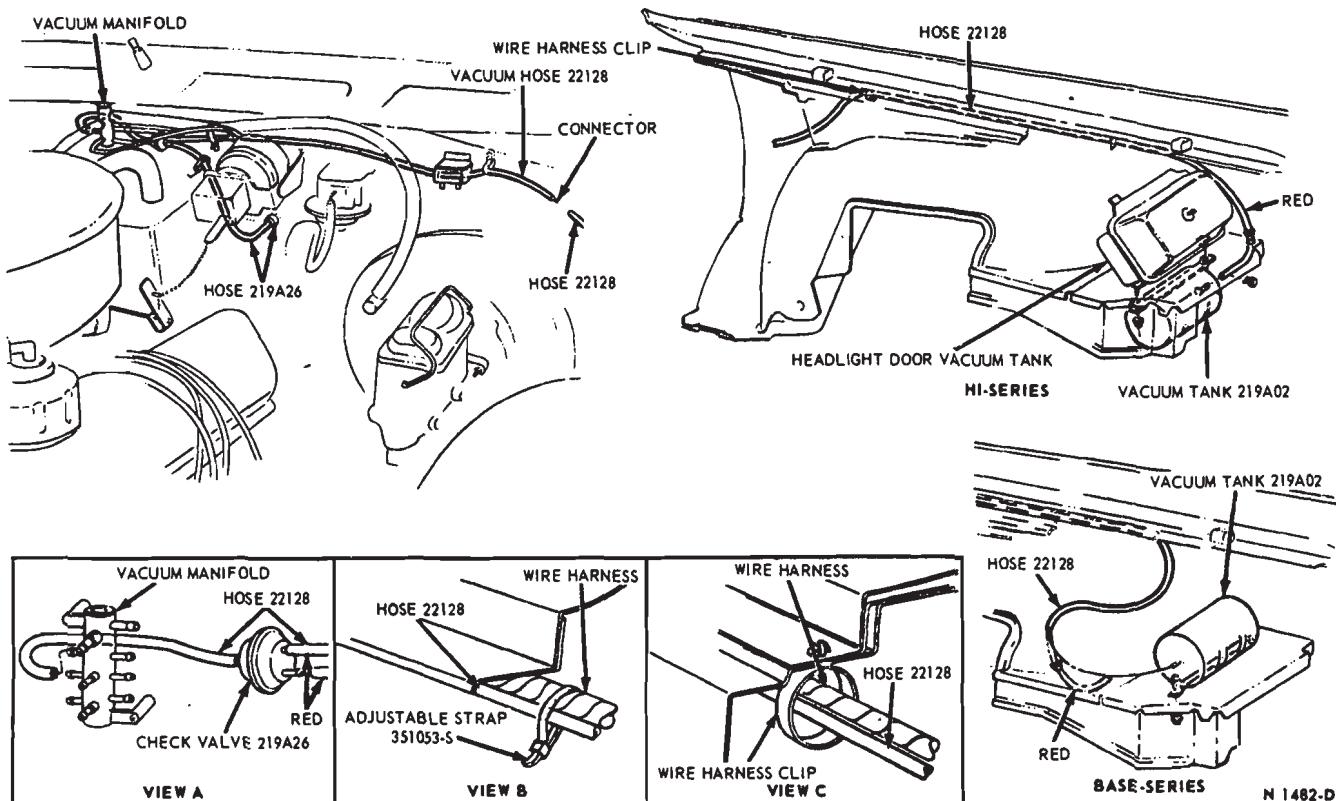
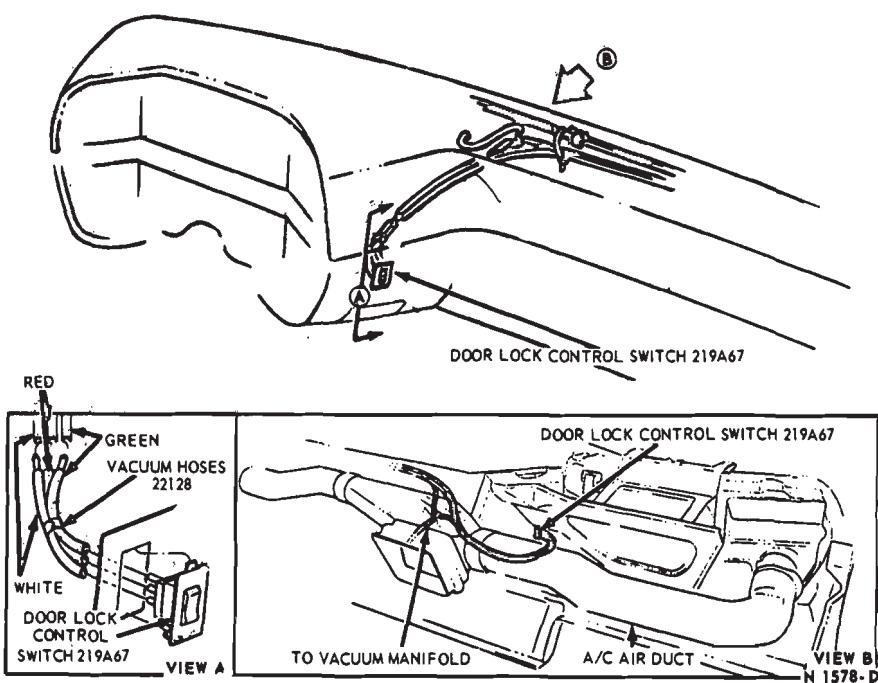


FIG. 1—Engine Compartment Vacuum Door Lock Component Installation—Ford, Mercury and Meteor



**FIG. 2—Vacuum Door Lock Control Switch Installation—Ford and Meteor**

#### FORD, MERCURY AND METEOR

The vacuum door lock system for Ford Mercury and Meteor models no longer uses a control valve. Vacuum is routed from the check valve through the dash panel directly to the door lock control switch. When either the lock or unlock side of the switch is activated, the lock or unlock vacuum hose port is opened and vacuum is routed into the lock or unlock vacuum hose to the door lock actuator. The door lock actuator is pulled up or down and the doors are locked or unlocked. When the control switch is released, the vacuum hose is returned to atmospheric pressure by air entering the hose through the lock control switch.

In addition, the Ford, Mercury and Meteor station wagons have a vacuum-operated tailgate lock available as part of the vacuum door lock system.

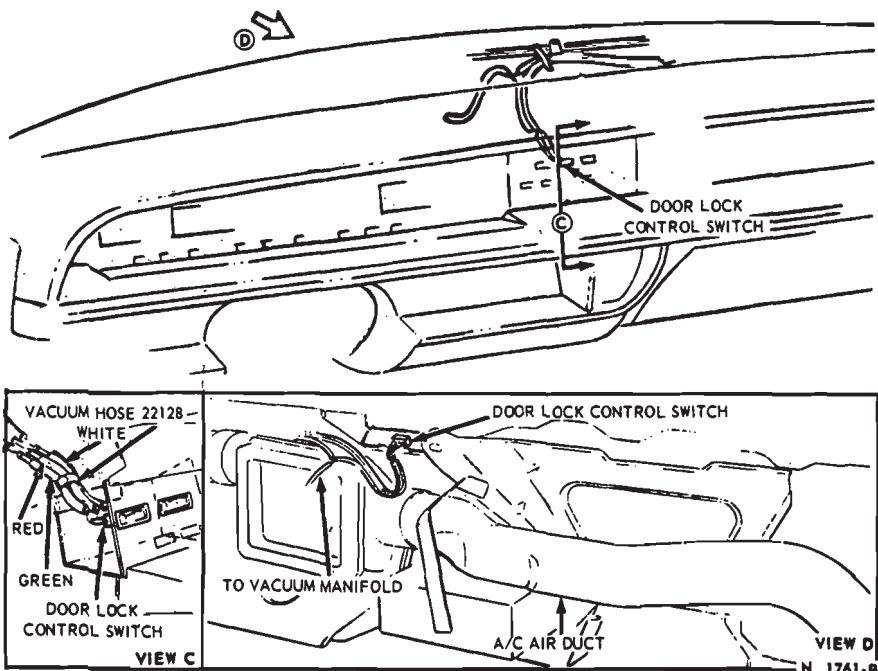
Vacuum hose routing is shown in Figs. 1 through 3. Vacuum schematics are shown in Fig. 4.

#### LINCOLN CONTINENTAL, CONTINENTAL MARK III AND THUNDERBIRD

A combination electric-vacuum control valve is used on the Lincoln Continental, Continental Mark III and Thunderbird vacuum door lock systems. Vacuum is routed from the intake manifold through the check valve to the control valve. The control valve is located under the instrument panel next to the glove compartment. The valve consists of a valve body, two solenoids and two plungers. When the lock control switch is depressed, current activates either the lock or unlock solenoid. The solenoid pulls a plunger which opens either the lock or unlock vacuum port. Vacuum is then routed to the door lock actuators through the vacuum hoses, pulling the actuators up or down to lock or unlock the doors.

The door lock control switch is located on a panel on the left front door on Thunderbird models. On Lincoln Continental and Continental Mark III models, door lock control switches are located in the arm rest on each front door.

Vacuum hose routings are shown in Figs. 5 through 9. Vacuum schematics are shown in Figs. 9 and 10.



**FIG. 3—Vacuum Door Lock Control Switch Installation—Mercury**

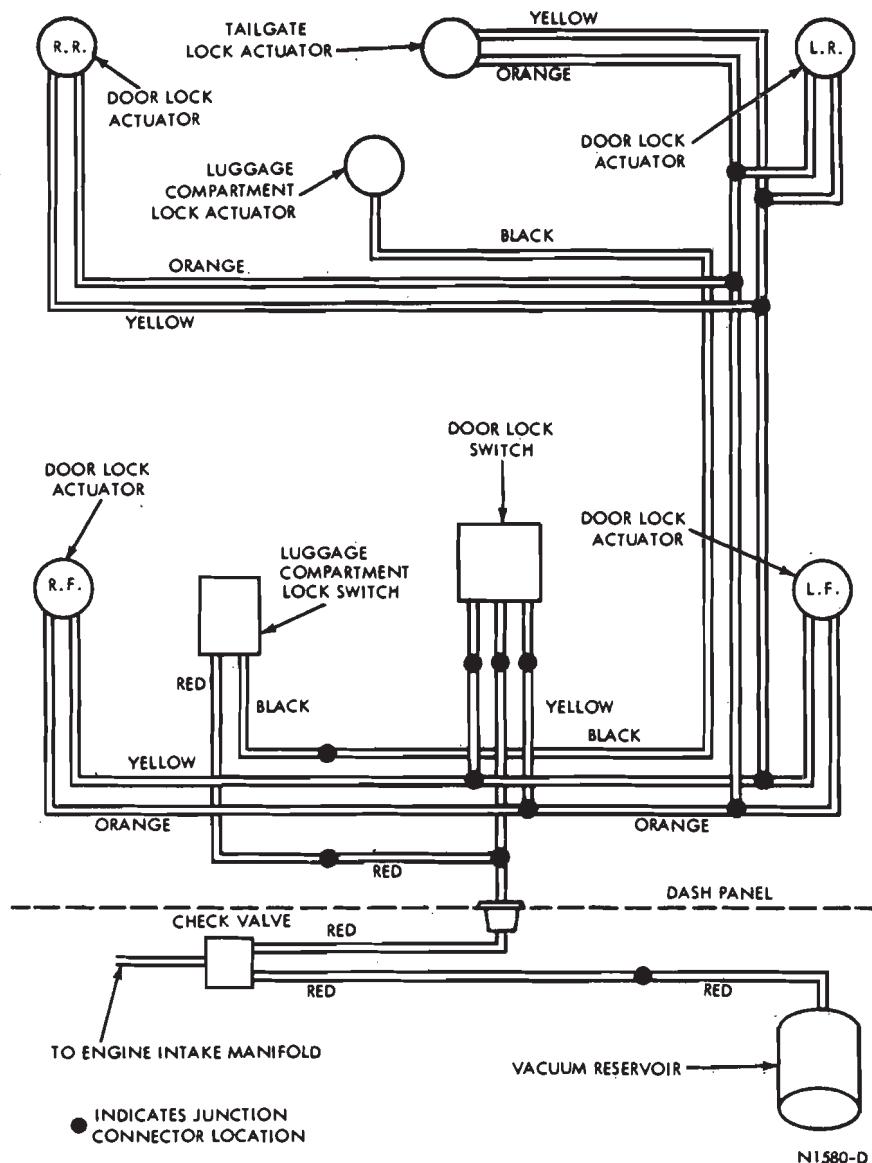


FIG. 4—Vacuum Door Lock Schematic

N1726-B

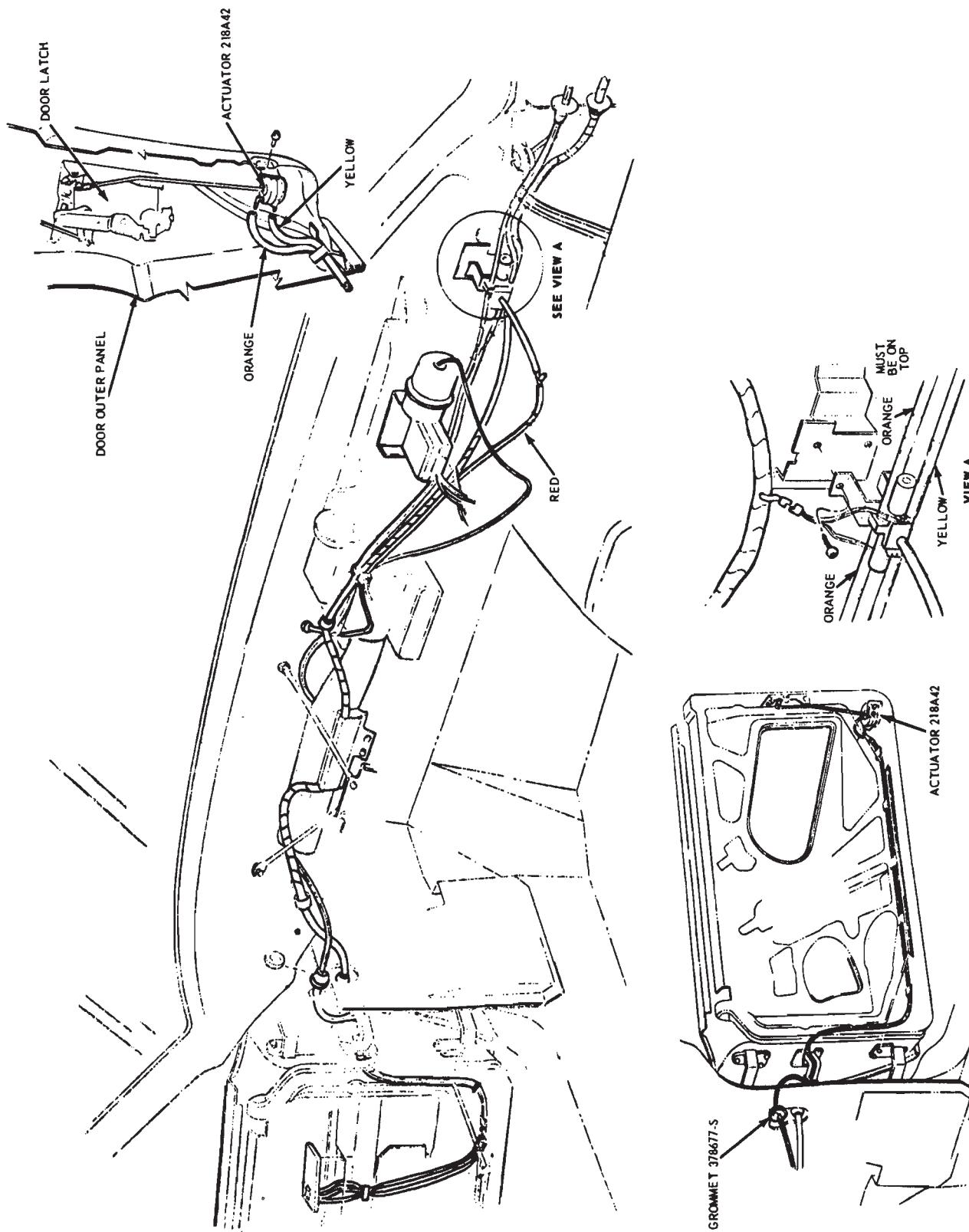


FIG. 5—Vacuum Door Lock System Installation—Passenger Compartment—Thunderbird and Continental Mark III

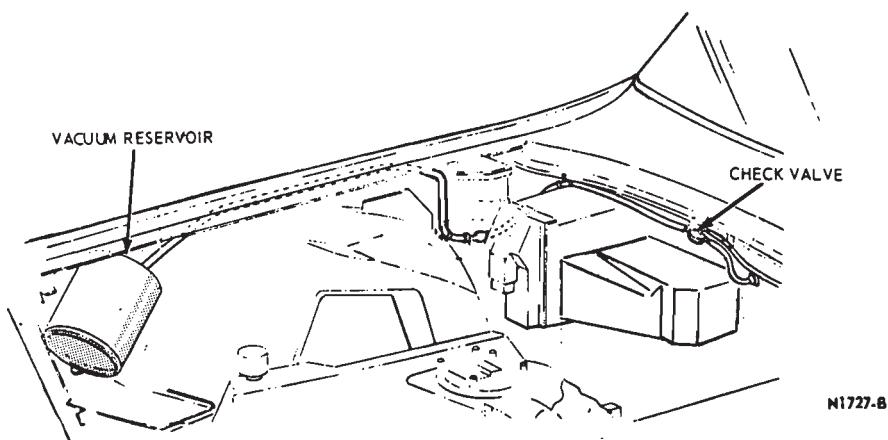


FIG. 6—Vacuum Door Lock System—Engine Compartment—Thunderbird and Continental Mark III

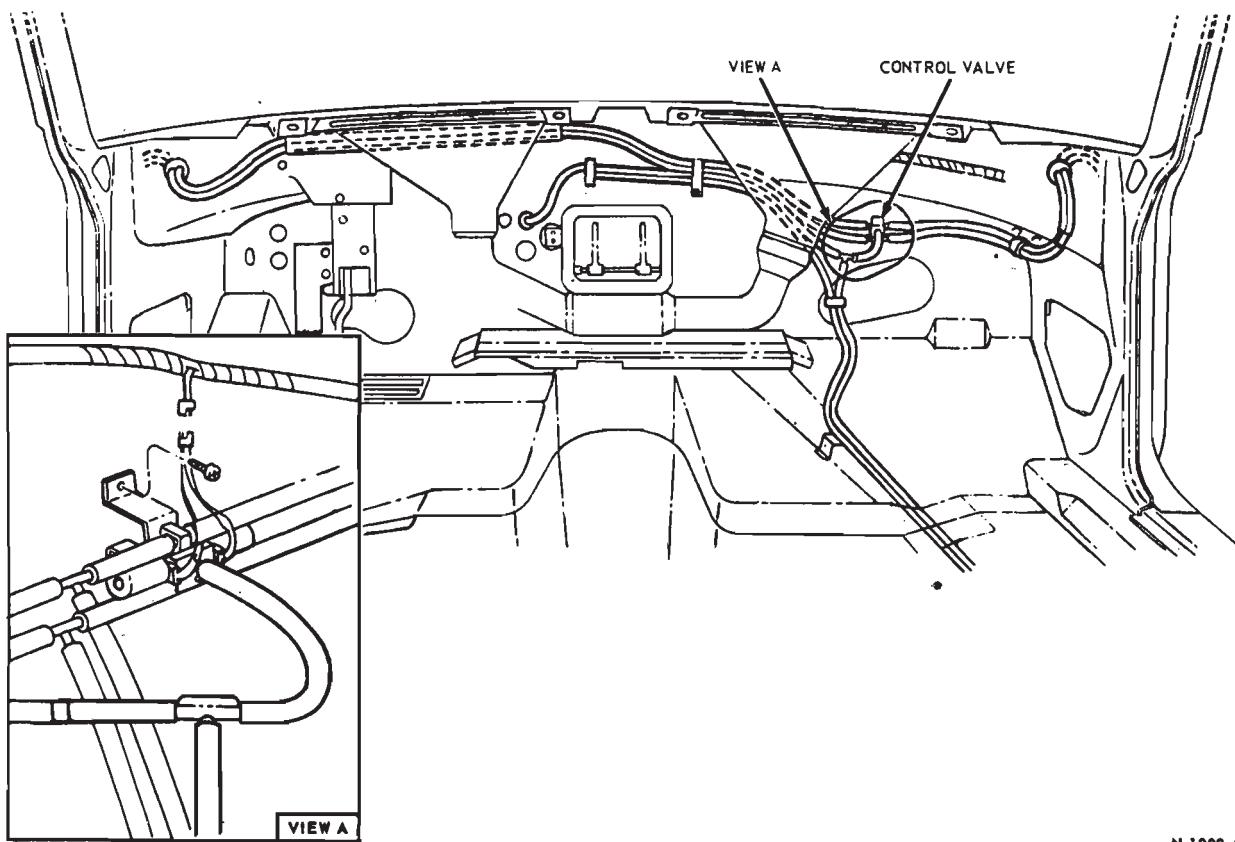
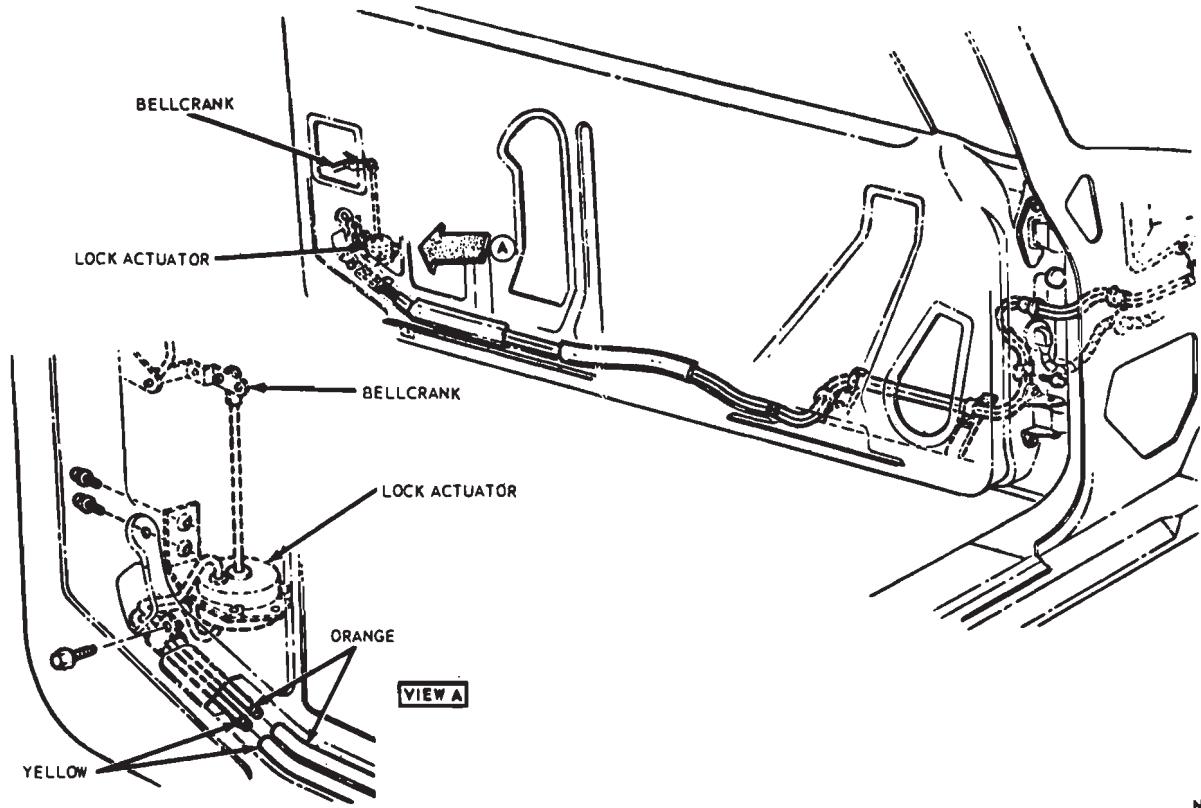
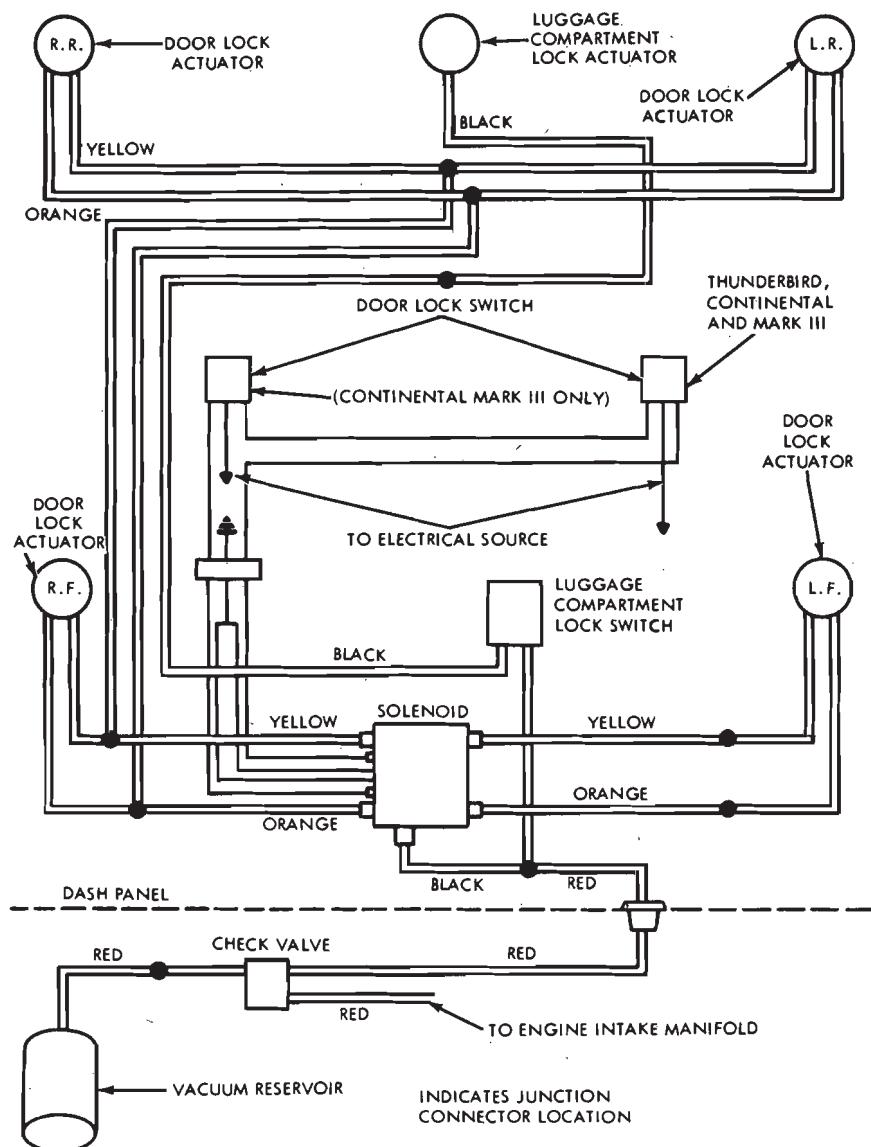


FIG. 7—Vacuum Door Lock Hose Routing—Passenger Compartment—Lincoln Continental



N 1809-A

FIG. 8—Vacuum Door Lock Hose Routing—Lincoln Continental



N1412-D

FIG. 9—Vacuum Door Lock Schematic—Thunderbird and Continental  
Mark III

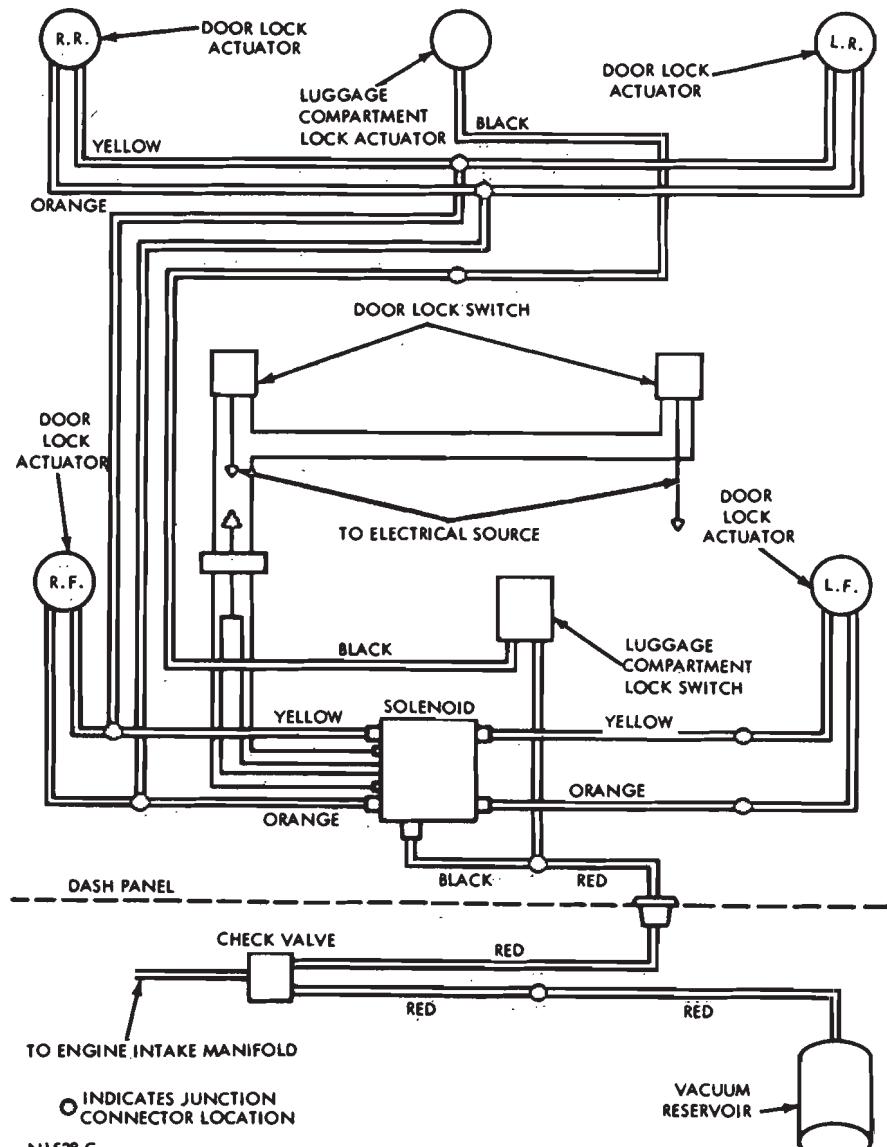


FIG. 10—Vacuum Door Lock Schematic

## 2 REMOVAL AND INSTALLATION

### VACUUM DOOR LOCK CONTROL VALVE—LINCOLN CONTINENTAL, CONTINENTAL MARK III AND THUNDERBIRD

To remove the control valve, remove the glove compartment liner. Then, disconnect the lock switch quick disconnect and remove the vacuum hoses from the control valve. Remove the retaining screws and re-

move the control valve.

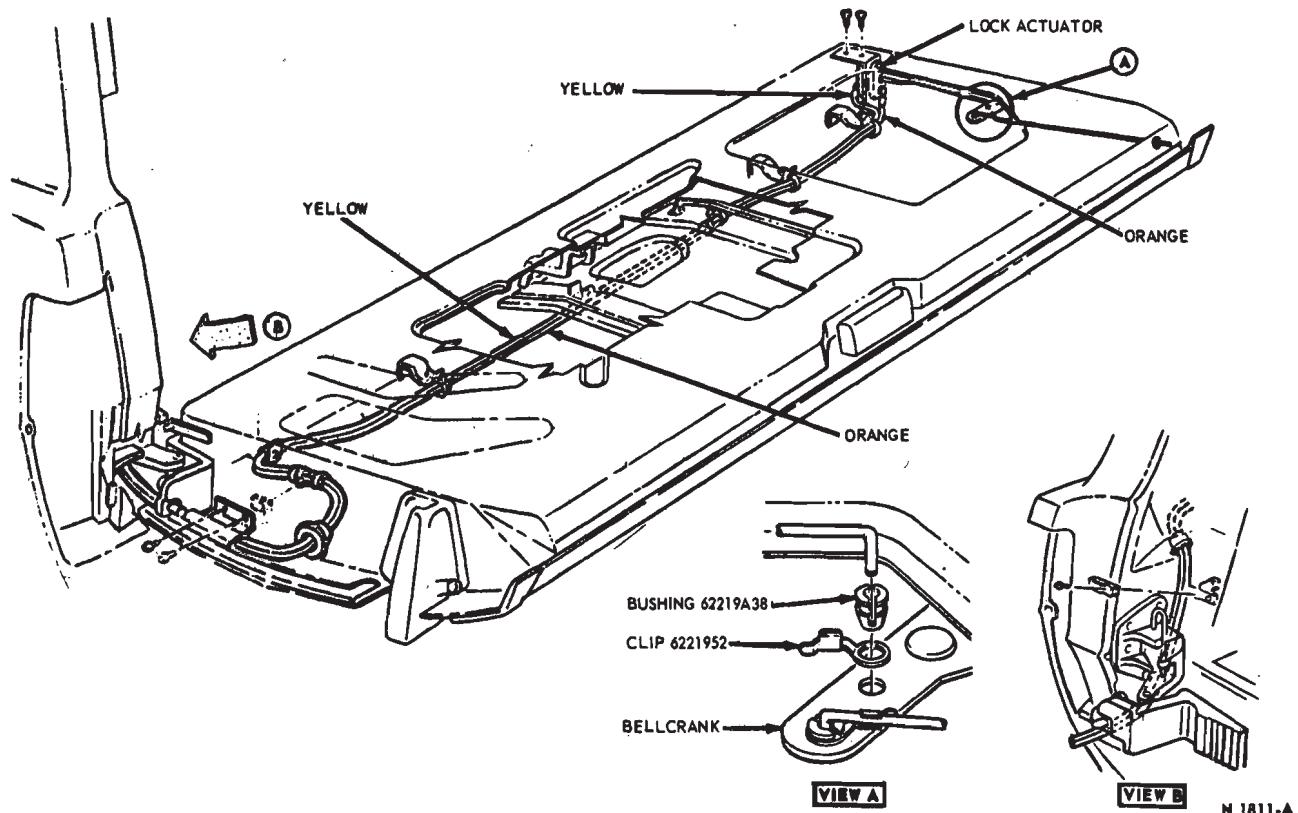
### VACUUM DOOR LOCK MOTOR—LINCOLN CONTINENTAL, FORD AND MERCURY

To remove the door lock motor, remove the door trim panel and weathersheet. Then, disconnect the vacuum motor link from the bell-

crank on rear doors or from the door latch on front doors. Remove the two screws attaching the motor to the door. Remove the vacuum hoses from the motor and remove the motor.

To install the motor, connect the vacuum lines to the motor and install the motor in the door. Connect the motor link to the bellcrank (rear doors) or latch (front doors). Then, install the weathersheet and the door

N1538-C



**FIG. 11—Tailgate Vacuum Lock Motor—Ford, Mercury and Meteor**

trim panel.

#### **DOOR LOCKING MECHANISM VACUUM MOTOR—THUNDERBIRD AND CONTINENTAL MARK III**

##### **REMOVAL**

1. Remove the trim panel and watershield from the door.
2. Disconnect the vacuum hoses from the vacuum motor.
3. Disconnect the vacuum motor to latch rod from the latch.
4. Remove two screws attaching the vacuum motor to the door and remove the motor.

##### **INSTALLATION**

1. Position the vacuum motor to

the door and install the two attaching screws.

2. Connect the motor to latch rod to the latch assembly.
3. Connect the orange hose to the top connection of the vacuum motor and the yellow hose to the bottom connection.
4. Check the operation of the door lock.
5. Install the watershield and trim panel on the door.

#### **VACUUM DOOR LOCK CONTROL SWITCH—LINCOLN CONTINENTAL, CONTINENTAL MARK III AND THUNDERBIRD**

To remove the control switch, remove the control panel from the arm rest. Release the spring clips and remove the switch from the control

panel.

#### **VACUUM DOOR LOCK CONTROL SWITCH—FORD, MERCURY AND METEOR**

Pry the switch from the opening and disconnect the vacuum hoses. Then, release the spring clips and remove the switch from the housing.

#### **TAILGATE LOCK MOTOR—FORD, MERCURY AND METEOR STATION WAGONS**

Remove the tailgate trim panel and weathersheet. Then, remove the two screws retaining the lock motor to the tailgate inner panel (Fig. 11). Disconnect the lock motor rod from the bellcrank and remove the motor from the tailgate.

# PART 37-03 Vacuum Headlight Covers

COMPONENT INDEX Applies Only to Models Indicated	All Models	Ford	Mercury	Cougar	Fairlane	Montego	Lincoln- Continental	Continental- Mark III
VACUUM HEADLIGHT COVER SYSTEM Description and Operation	03-01							
Tests	03-04							
VACUUM MOTOR Removal and Installation		03-05	03-05	03-05	03-05	03-05	03-05	03-05
VACUUM RESERVOIR Removal and Installation	03-06							
<p>A page number indicates that the item is for the vehicle(s) listed at the head of the column.</p> <p>N/A indicates that the item is not applicable to the vehicle(s) listed.</p>								

## 1 DESCRIPTION AND OPERATION

The headlight covers are opened and closed by one vacuum motor on Lincoln Continental, Ford, Mercury, Cougar, Fairlane and Montego vehicles and two vacuum motors on Continental Mark III vehicles. Refer to Figs. 1, 2 and 3 for location of the headlight cover operating components and installation. Note the vacuum hose routing, connections and color codes.

The headlight switch, when pulled full out actuates a distribution valve located on the back of the headlight switch. The distribution valve applies vacuum to the vacuum motor(s) operating the headlight covers. The distribution valve also provides a vacuum relief (exhaust) port to that side of the vacuum motor diaphragm to which vacuum is not applied.

When the headlight switch is pushed in to turn the headlights off, the vacuum supply and relief positions of the distribution valve are reversed. This subjects the opposite side of the vacuum motor diaphragm(s) to engine vacuum, and also vents the vacuum at the opposing side of the diaphragm(s)

to atmospheric pressure. The vacuum motor(s) close the headlight covers.

A reserve vacuum reservoir provides vacuum storage which permits limited cycling of the headlight covers without the car engine running.

A check valve is used in the vacuum source line to prevent vacuum from leaking from the reservoir back through the engine. On Lincoln Continental models, the check valve is integral with the vacuum manifold assembly.

### LINCOLN CONTINENTAL, FORD, MERCURY, COUGAR, FAIRLANE AND MONTEGO

A cover hinge spring, attached to each cover, functions as an overcenter type spring, which helps to hold the covers in the open or closed position. Vacuum applied to either side of the vacuum motor diaphragm during opening or closing, overcomes this spring tension.

If the headlight covers will not open automatically, a by-pass valve is provided to vent the system and allow

the covers to open. The valve is located in the vacuum lines between the headlight switch and the vacuum motor.

### CONTINENTAL MARK III

Each headlight cover vacuum motor is equipped with an internal spring. The internal spring will automatically open the headlight cover in the event the vacuum system should fail. If the engine has been shut down long enough to allow a normal leak-down in the vacuum system (overnight), the spring will open the headlight cover.

When the Continental Mark III headlights are turned on, an indicator light in the roof console will glow if either headlight cover is not fully opened (raised). It is normal for the indicator light to glow for a short interval after the headlights are turned on, until both covers are fully opened. The indicator light is controlled by two switches, one at each headlight cover.

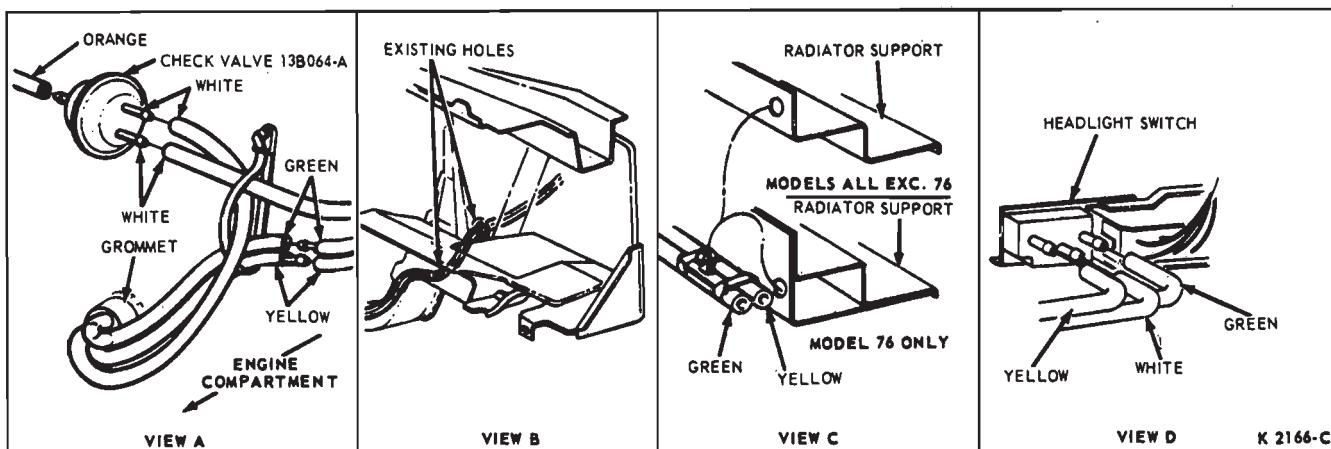
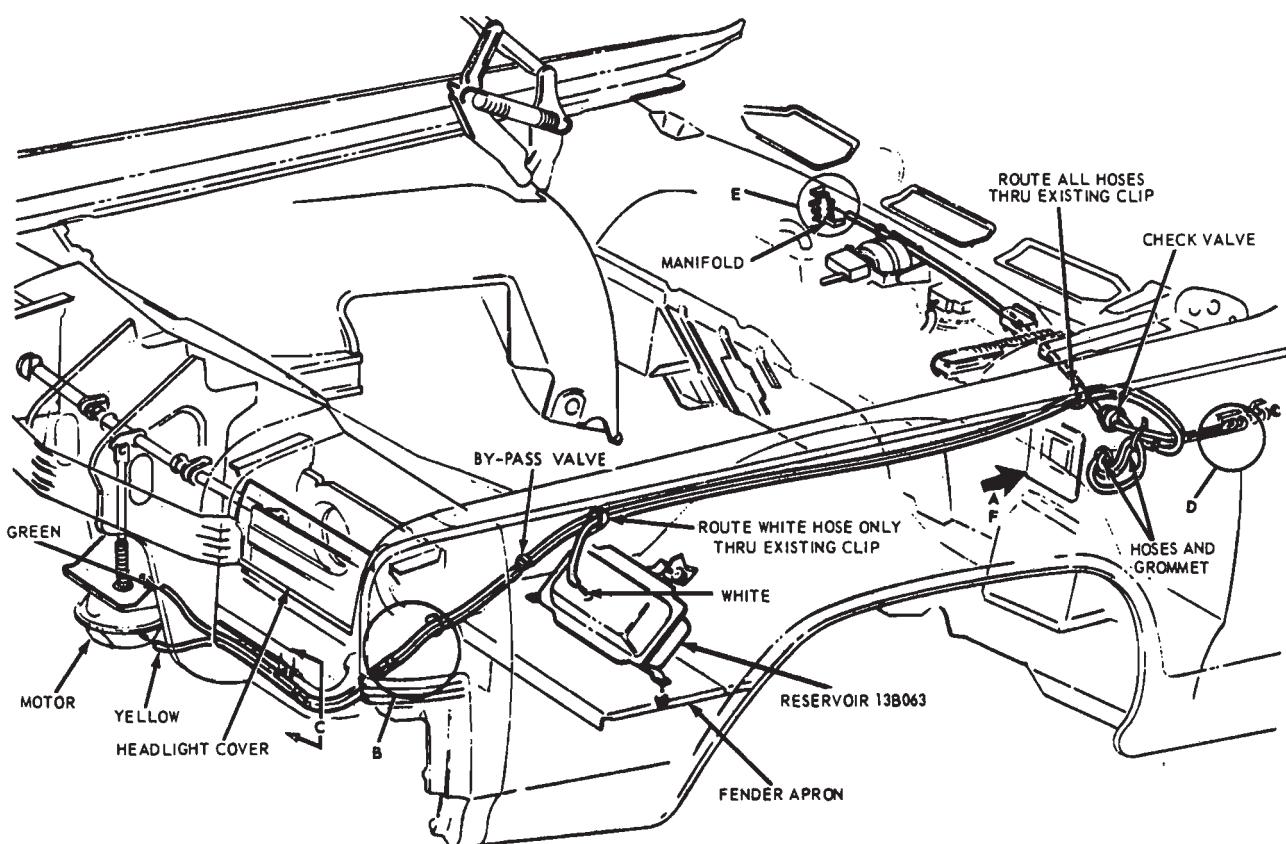
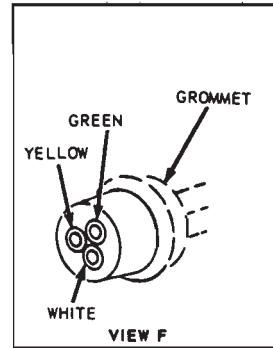
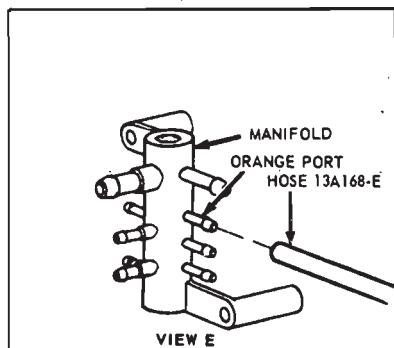


FIG. 1—Headlight Covers and Vacuum System—Mercury, Typical Ford and Cougar

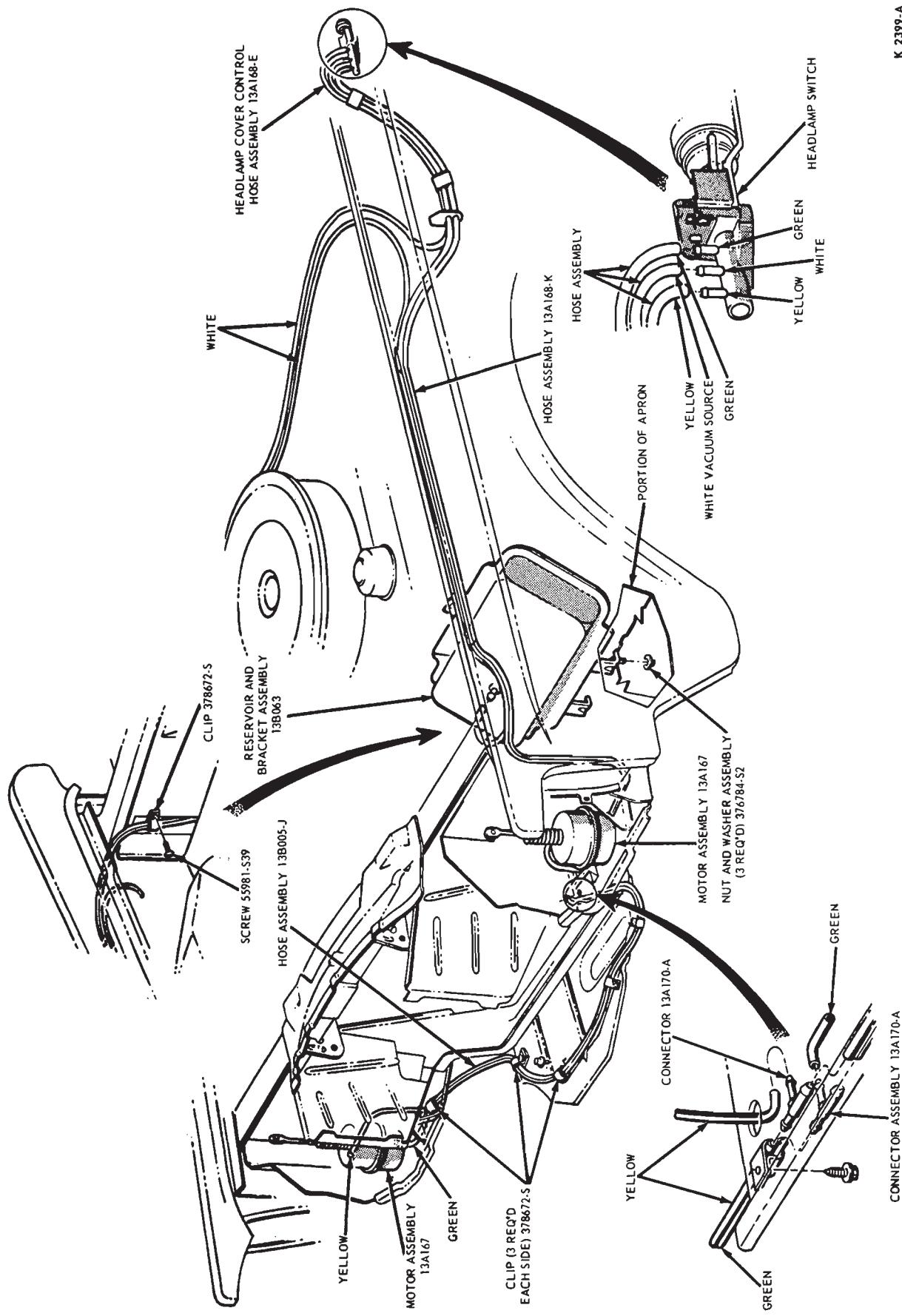


FIG. 2—Headlight Covers and Vacuum System—Continental Mark III

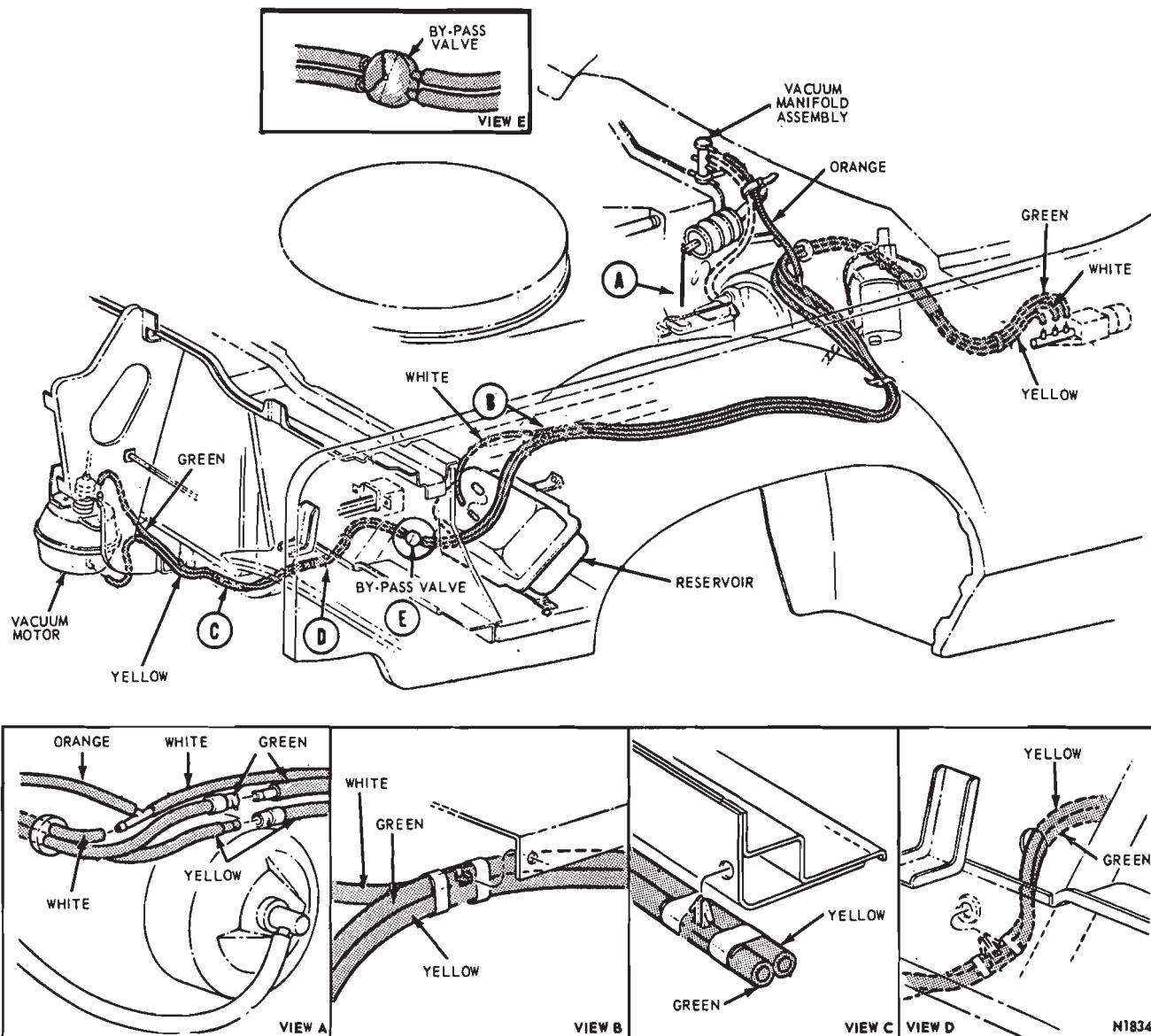


FIG. 3—Headlight Covers and Vacuum System—Lincoln Continental

## 2 TESTS

### HEADLIGHT COVER VACUUM SYSTEM LEAK TEST

A leak test on any part or component of the headlight cover vacuum system, can be accomplished with the use of the vacuum test probe. Refer to Vacuum Test Probe for fabrication. To perform the leak test, plug the probe into the system at the desired point. The reading on the gauge should momentarily fall below the pre-set value of 14 inches of vacuum.

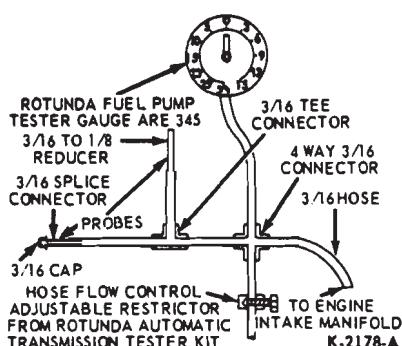
If there are no leaks in that part of the system being checked, the gauge reading should come back to 14 inches of vacuum and hold steady. If a leak is present in the system, the gauge reading will not come up to 14 inches of vacuum.

The leak test for the headlight switch can be accomplished by attaching the vacuum test probe to the center (white) port of the headlight switch and capping the two outside ports. Move the switch selector thru

the OFF-PARK-ON position and observe the reading on the vacuum probe gauge. The gauge should read 14 inches of vacuum in all of the positions. If the reading should fall off at any of the positions, the headlight switch should be replaced.

### VACUUM TEST PROBE

A vacuum gauge is required to diagnose and test a vacuum control system. The Rotunda Fuel Pump



**FIG. 4—Vacuum Test Probe**

Tester Gauge (ARE345) is recommended. It is also recommended that the vacuum gauge be used, as a part of a vacuum probe tester. Ordinarily, a vacuum gauge is used alone to measure the vacuum from a vacuum system hose or nipple, reservoir, or

the engine intake manifold. A vacuum probe tester, on the other hand, is used to supply a definite amount of vacuum to a particular point in the system. It tests the system from this point to a component.

A vacuum probe tester is not commercially supplied, but it is easily made.

- Cut or splice a length of 3/16-inch hose long enough to reach from the engine intake manifold to the most remote component in the vacuum system. Call the ends of the hose the manifold end and the working end.

- Insert a 4-way connector into the working end of the hose.

- Attach a vacuum gauge to one of the 4-way connector nipples (Fig. 4).

- Install a short length of 3/16 hose with an adjustable hose restrictor on another nipple of the 4-way connectors.

- Install a short length of hose on the last nipple of the 4-way connector. Insert a Tee connector into this hose.

- Install a short length of hose to the two open ends of the Tee connector (Fig. 4). Install a 3/16-1/8 reducer in one hose and a 3/16 splice connector in the other hose. By adding or removing connectors (splices) to this test probe hoses, they can be connected to any 3/16-1/8 hose, nipple, or connector, while the other test hose is plugged, or both the 3/16 and 1/8 tester probes can be used at the same time.

To adjust the probe to the required 14 inches of test vacuum, plug the test probe hoses into the vacuum source at the carburetor, and adjust the hose restrictor until the vacuum gauge reads 14 inches. The vacuum supply at the end of the test probe hoses should be checked often, as the engine warms up, loads up, etc.

### 3 REMOVAL AND INSTALLATION

#### VACUUM MOTOR—COUGAR

The motor push rod is connected to the cover actuating shaft by a spring clip. Push the clip tab out to release the clip, and then pull the clip up and off. Remove the mounting nuts, disconnect the vacuum hoses and remove the motor from under the vehicle.

#### VACUUM MOTOR—FORD, MERCURY, AND LINCOLN CONTINENTAL

On Mercury vehicles, the grille upper section must be removed first.

- Disconnect two vacuum hoses from the cover motor (Fig. 1).

- Disconnect the clip retaining the motor control rod to the headlight cover outer shaft assembly and remove the rod from the shaft.

- Remove the two nuts retaining the motor assembly to the motor support and remove the motor through the opening at the bottom of the vehicle.

- Position the motor assembly to the support bracket and install the two retaining nuts.

- Position the motor control rod to the shaft assembly and install the retaining clip.

- Connect the vacuum hoses to the

motor assembly (green stripe on top of the motor and yellow stripe on the bottom). Check the operation of the motor.

#### VACUUM MOTOR—CONTINENTAL MARK III

##### REMOVAL

- Remove the clip retaining the vacuum motor rod pin to the end of the cover actuator bracket, and disengage the rod pin from the bracket. If the vacuum has been exhausted from the headlight cover operating system, causing the covers to open and prevent access to the actuator bracket, run the engine long enough to return the covers to the closed position.

- From under the car, remove the four screws and washers retaining the vacuum motor lower support plate. Pull the lower support plate and vacuum motor down far enough to disconnect the vacuum hoses at the top and bottom of the vacuum motor case. Remove the vacuum motor and support plate.

- Remove the vacuum motor retaining pin and nut, and separate the vacuum motor and support plate.

##### INSTALLATION

- Position the vacuum motor to the support plate so that the vacuum motor hose fittings will point inboard when installed, and install the vacuum motor retaining pin and nut.

- With the vacuum motor and support plate held slightly below the installed position, connect the yellow vacuum hose to the top hose fitting on the vacuum motor case and connect the green vacuum hose to the bottom fitting.

- Move the vacuum motor and support plate into position and install the four lower support plate retaining screws and washers.

- Run the engine long enough to cause the vacuum motor actuator rod to extend (the opposite headlight cover will close). Lubricate the pin of the actuator rod with lubricant C4AZ-19584-A and install the rod pin to the cover actuator bracket with the clip.

#### VACUUM MOTOR—FAIRLANE AND MONTEGO

- Remove the clip retaining the motor control rod to the headlight cover shaft. Separate the rod from the shaft.

2. Remove 7 of the 10 bolts retaining the valence panel to the bumper and the hood latch support bracket. Allow the valence panel to hang.

3. Disconnect both vacuum hoses from the motor.

4. Remove the two nuts retaining the motor assembly to the motor support and remove the motor assembly.

5. Position the motor to the support bracket and install the retaining nuts.

6. Connect both vacuum hoses to the motor. The yellow hose should be connected to the top fitting; the green hose should be connected to the bottom fitting.

7. Install the clip to retain the motor control rod to the headlight cover shaft. Check the operation of

the motor.

8. Install the valence panel.

#### VACUUM RESERVOIR

1. Raise the left front of the vehicle and remove the left front tire and wheel assembly.

2. From under the fender, remove the nuts and washers retaining the headlight cover vacuum reservoir to the front fender apron and wheel housing.

On Cougar vehicles, reach under the fender and remove the four bolts retaining the vacuum reservoir to the reservoir retaining bracket behind the left headlights.

3. Disconnect the vacuum hose

from the reservoir and remove the reservoir.

4. Connect the vacuum hose to the vacuum reservoir.

5. On Cougar vehicles, position the reservoir to the reservoir retaining bracket and install the four retaining bolts.

On all other vehicles so equipped, place the reservoir in position fitting the retaining studs into the holes in the front fender apron and wheel housing. From under the fender, install the nuts and washers to the studs.

6. Install the left front tire and wheel assembly and lower the vehicle. Check the operation of the headlight covers.

# PART 37-04 Vacuum Luggage Compartment Door Lock

COMPONENT INDEX Applies Only to Lincoln Continental, Continental Mark III, Thunderbird and Mercury	All Listed Models	COMPONENT INDEX Applies Only to Lincoln Continental, Continental Mark III, Thunderbird and Mercury	All Listed Models
MOTOR—LUGGAGE COMPARTMENT LATCH Removal and Installation .....	04-02	VACUUM LUGGAGE COMPARTMENT LOCK SYSTEM Description and Operation .....	04-01
REMOTE VACUUM SWITCH— LUGGAGE COMPARTMENT LATCH Removal and Installation .....	04-02		

A page number indicates that the item is for the vehicle(s) listed at the head of the column.

## 1 DESCRIPTION

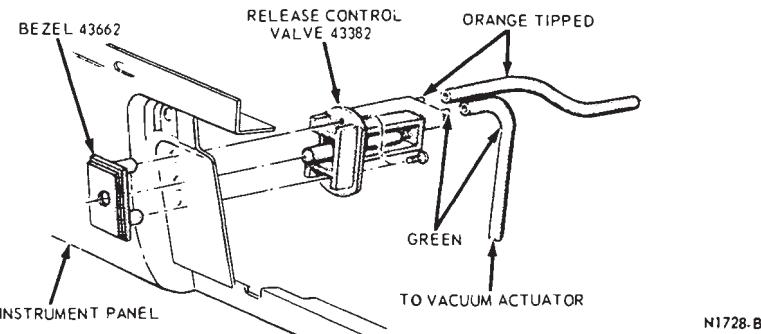


FIG. 1—Luggage Compartment Door Latch Release Control Valve—Thunderbird, Continental Mark III

The luggage compartment door vacuum latch control system consists of a latch release control valve, a latch motor assembly, and the necessary hoses to connect the components. Vacuum to operate the system is supplied by the vacuum reservoir, located in the engine compartment. This reservoir also supplies vacuum for other vacuum systems.

A T-Connection in the reservoir supply hose furnishes a tap into the supply and is connected to the release control valve mounted inside the glove compartment door (Figs. 1 and 2). The push button-type valve applies the vacuum to the vacuum motor supply hose which is routed to the luggage compartment. The motor is attached to a lever on the latch assembly by means of a flexible cable.

When vacuum is supplied to the motor, movement of the motor diaphragm moves the lever on the latch assembly which releases the latch allowing the door to open. When the control valve on the dash panel is released, the vacuum bleeds out of the motor system and the latch arm swings back into a normal locked position. Key unlocking action is not affected by this system.

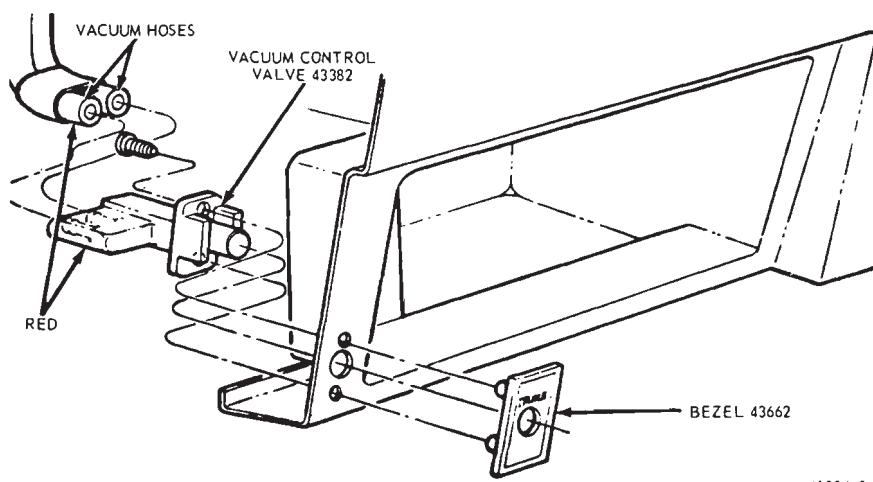


FIG. 2—Luggage Compartment Door Latch Release Control Valve—Lincoln Continental and Mercury

## 2 REMOVAL AND INSTALLATION

### LUGGAGE COMPARTMENT LATCH REMOTE VACUUM SWITCH

Remove the glove compartment liner, and disconnect the vacuum hoses from the switch. Then, remove two switch attaching screws and remove the switch and bezel (Figs. 1 and 2).

### LUGGAGE COMPARTMENT DOOR LATCH VACUUM MOTOR

1. Open the luggage compartment door and disconnect the vacuum hose from the motor.
2. Remove the two motor attaching screws.
3. Disconnect the motor wire from the latch and remove the motor.

4. Connect the motor wire to the latch and install the two motor attaching screws.

5. Position the motor to remove slack from the trip wire and tighten the motor attaching screws.

6. Connect the vacuum hose to the motor and check the operation of the latch and motor.